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REMARKS

Claim Rejections - 35 USC §112

Claims 30-45 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Examiner states:

> "The limitation "said base having said torch bump bonded to the flat top area at a flat bottom area of the torch bump, said flat top area is larger than the flat bottom area" renders the claim indefinite because it is unclear what the applicant try [sic] to claim."

Regarding claim 30, it is respectfully submitted that the claimed element, taken as a whole, parses correctly in patent terminology and is definite and clear. The entire claimed element is:

> "a base of said torch bump overlying said contact pad and having a flat top area, said base having said torch bump bonded to the flat top area at a flat bottom area of said torch bump, said flat top area larger than the flat bottom area."

In relevant portion, the base has a "flat top area":

"a base...having a flat top area..." [deletion for clarity]

The base has the torch bump bonded to the flat top area. The antecedent basis for the "flat top area" is the base "flat top area":

"said torch bump bonded to the flat top area..." [deletion for clarity]

The torch bump has a flat bottom area where the bond is:

"torch bump bonded...at a flat bottom area of said torch bump..." [deletion for clarity]

Finally, the flat top area of the base is larger than the flat bottom area of the torch bump. This is because the antecedent basis for the flat top area relates to the base and the antecedent basis for the flat bottom area relates to the torch bump:

> "said flat top area [of the base][is] larger than the flat bottom area [of the torch bump]." [insertions for clarity]

Claims 31-45 directly or indirectly depend from claim 30.

Thus, it is respectfully submitted that claims 30-45 are allowable under 35 U.S.C. §112, second paragraph, as being definite for particularly pointing out and distinctly claiming the subject matter which applicant regards as the invention.

Claim Rejections - 35 USC §102

Claims 30-31, 36-37, and 41-44 are rejected under 35 U.S.C. §102(e) as being anticipated by Chin et al. (U.S. Patent No. 6,541,366, hereinafter "Chin").

The Examiner states:

> "Referring to figures 2a-2c, Chin et al. teaches a structure for a torch bump, comprising:
>
> ...
>
> Flat bottom area of the base of the torch bump is smaller than the flat top area of the torch bump (see figure 2a-2c)." [deletion and underlining for clarity]

Applicants respectfully disagree. The Examiner has misread the last limitation of claim 30, which correctly is:

> "said flat top area [of the base] [is] larger than the flat bottom area [of the torch bump]" [insertions and underlining for clarity]

By reference to Chin Figures 2A-2C, it may be seen that the flat top area of the base 14C is smaller than the flat bottom area of the torch bump 18B. Thus, the claimed limitation does not read on Chin.

Regarding claims 31, 36-37, and 41-44, these dependent claims respectively depend from independent claim 30 and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations thereof.

Based on the above, it is respectfully submitted that claims 30-31, 36-37, and 41-44 are allowable because

> "Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, *arranged as in the claim*." [*emphasis added*] Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co. (730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984)(citing Connell v. Sears, Roebuck & Co., 722 F.2d 1542, 220 USPQ 193 (Fed Dir. 1983)))

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Claims 30-31, 36, 41-42, and 44 are rejected under 35 U.S.C. §102(e) as being anticipated by Lin et al. (U.S. Patent No. 6,426,281, hereinafter "Lin").

The Examiner states:

> "Referring to figures 11-17, Lin et al. teaches a structure for a torch bump, comprising:
>
> ...
>
> Flat bottom area of the base of the torch bump is smaller than the flat top area of the torch bump (see figure 14-17)." [deletion and underlining for clarity]

Regarding claim 30, Applicants respectfully disagree. The Examiner has misread the last limitation of claim 30, which correctly is:

> "said flat top area [of the base] [is] larger than the flat bottom area [of the torch bump]" [insertions and underlining for clarity]

By reference to Lin FIG. 17, it may be seen that the flat bottom area of the torch bump 50 to be the same size as the flat top area of the base 48. Thus, the claimed limitation does not read on Lin.

Regarding claims 31, 36, 41-42, 44, these dependent claims respectively depend from independent claim 30 and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations thereof.

Based on the above, it is respectfully submitted that claims 30-31, 36, 41-42, and 44 are allowable under 35 U.S.C. 102(e) as not being anticipated by Lin because

> "If the reference fails to teach or suggest even one limitation of the claimed invention, then the claim is not anticipated." Atlas Powder Co. v. E.I. du Pont De Nemours & Co., 750 F.2d 1569, 1574, 224 U.S.P.Q. 409, 411 (Fed. Cir. 1984).

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Claim Rejections - 35 USC §103

Claims 32-35, 37-40, 43, and 45 are rejected under 35 U.S.C. §103(a) as being unpatentable over Lin et al. (U.S. Patent No. 6,426,281, hereinafter "Lin") as applied to claims 30-31, 36, 41-42, and 44 above in view of the Admitted Prior Art of the Present Invention (pages 15-16, hereinafter "APA") and Chin et al. (U.S. Patent No. 6,541,366, hereinafter "Chin").

As a point of correction, it is respectfully submitted that the Examiner made the rejections based on APA pages 15-16. It believed the Examiner meant pages 5-6.

The Examiner states:

> "Therefore, it would have been obvious to a person of ordinary skill in the requisite art at the time of the invention was made [sic] would form a base of the solder ball comprising a layer of copper, a layer of nickel, followed by a layer of gold in process of Chiu et al. as taught by the Admitted Prior Art because the process is known in the art to create a solder ball
>
> ...
>
> Therefore, it would have been obvious to a person of ordinary skill in the requisite art at the time of the invention of the invention was made [sic] would form a solder layer by using eutectic solder paste in process of Lin et al. as taught by Chin et al. because the process would provide a high performance solder bump, also determining the optimum material for the layer only involved routine skill in the art.
>
> The thickness range of the metal layers and the dry films are considered to involve routine optimization while [sic] has been held to be within the level of ordinary skill in the art. As noted in In re Aller 105 USPQ233, 255 (CCPA 1955), the selection of reaction parameters such as temperature and concentration would have been obvious:
>
> ...
>
> Therefore, one of ordinary skill in the requisite art at the time the invention was made would have used any thickness range suitable to the method in process of Lin et al. in order to optimize the process."

Applicants have explained above how Lin and Chin do not anticipate the claimed invention; Lin and Chin teach away from the claimed limitation with Lin teaching exactly the opposite size relationship and Chin teaching a different size relationship. AAPA FIG. 2-Prior Art teaches the Lin size relationship and AAPA FIG. 1-Prior Art teaches the Chin size relationship. The three cited references taken as a whole do not teach or suggest the claimed size relationship.

It is also respectfully submitted that the Examiner's statements are conclusions without providing motivations for the suggested combination. MPEP §2143.01 states:

> The combination of references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a *prima facie* case of obvious was held improper. The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999)

Regarding claims 32-35, 37-40, 43, and 45, these dependent claims depend directly or indirectly from independent claim 30 and are believed to be allowable since they contain all the limitations set forth in the independent claim from which they depend and claim additional unobvious combinations thereof.

Based on the above, it is respectfully submitted that claims 32-35, 37-40, 43, and 45 are allowable under 35 U.S.C. §103(a) as not being obvious based on Lin in view of APA and Chin, which do not teach or suggest the claimed limitation, because:

> "If the reference fails to teach or suggest even one limitation of the claimed invention, then the claim is not anticipated." Atlas Powder Co. v. E.I. du Pont De Nemours & Co., 750 F.2d 1569, 1574, 224 U.S.P.Q. 409, 411 (Fed. Cir. 1984).

Response to Arguments

The Examiner stated that Applicants' arguments with respect to claims 30-45 have been considered but are moot in view of the new ground(s) of rejection.

It is respectfully submitted that the rejections of claims 30-45 have been traversed above.

Conclusion

In view of the above, it is submitted that the claims are in condition for allowance and reconsideration of the rejections is respectfully requested. Allowance of claims 30-45 at an early date is solicited.

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To the extent necessary, a petition for an extension of time under 37 C.F.R. §1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including any extension of time fees, to Deposit Account No. 50-0374 and please credit any excess fees to such deposit account.

Respectfully submitted,

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